



HERA Update URSI NRSM January 11, 2019

History of the Universe









HERA Program





NSF MSIP-2016

\$9.5M over 3 years
Construct 240 core elements
Measure 21-cm power spectrum

as array grows

Constrain key reionization

parameters

Gordon & Betty Moore Foundation

\$5.8M over 5 years Construct to 350 elements Extend freq performance 50-237 MHz Investigate EoX

NSF MSIP-2018

\$7.2M over 5 years
Observe and analyze with full array
Measure power spectrum
Investigate/incorporate Imaging techniques
Early support for cross-corr
Next-gen design specs
Public data



GORDON AND BETTY FOUNDATION



Team at our last project meeting (Oct 2018)



-400

-200

0

200

400













CHAMP – What is it?

- 5-6 CAMPARE scholars per year (4 CAMPARE scholars at UC Berkeley last 2 years)
- 5-6 South African Master's/PhD students per year
- 1 week radio astronomy "boot camp" at beginning of summer at CPP
 - Cover basics of radio astronomy, interferometry, python programming, etc.
 - Cultural exchange and social activities
- Next 9 weeks at one of 6 HERA sites in groups of 2-4 to conduct research

South African students at U Penn Summer 2015





Pulse generator built for HERA by CAMPARE scholar Manuel Paul UC Berkeley, Summer 2015

Cal Poly Pomona Astronom South African interns working on telescope in SA

















HERA Take Away



HERA is an international specialized experiment to detect and characterize the power spectrum signature arising from the EOR

HERA is fully funded.

HERA is an SKA Precursor located on the South African SKA site.

It will comprise 350 14-m transit elements: 320 in a compact array, with 30 outriggers, all within 1 km

Operate from 50-237 MHz

201 elements in the Karoo (and increasing)

A 2-element test array in GB

A 4-element test array in Cambridge, UK

1-element in AZ to investigate drone techniques

https://reionization.org

